A&A 562, C3 (2014)
DOI: 10.1051/0004-6361/201219200e


Astronomy & Astrophysics

# Integrated spectroscopy of the *Herschel* Reference Survey

## The spectral line properties of a volume-limited, *K*-band-selected sample of nearby galaxies

## *(Corrigendum)*

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A&A 550, A114 (2013), DOI: 10.1051/0004-6361/201219200

**Key words.** galaxies: spiral – galaxies: ISM – dust, extinction – errata, addenda

We noticed an error in the bisector fitting procedure adopted in our paper. Because of this error, there are some erroneous values in the slopes and intercepts given in Table 6 and in the best fit shown in Figs. 14 and 16. The corrected values and figures are given below. The updated $C(\mathrm{H}\beta)$ vs. $\beta_{\mathrm{GALEX}}$ relations (bisector fit) are: $C(\mathrm{H}\beta) = 1.25 \times \beta_{\mathrm{GALEX}} + 1.87$; Spearman coefficient $\rho = 0.56$, shared by HI-deficient and HI-normal galaxies (solid line). A very similar relation is obtained excluding those galaxies hosting an AGN ($C(\mathrm{H}\beta) = 1.32 \times \beta_{\mathrm{GALEX}} + 1.91$; Spearman coefficient $\rho = 0.61$). These errors do not change the major conclusions of the paper.

**Table 6.** Relationships between $C(\mathrm{H}\beta)$ and the different physical parameters (Fig. 14).

| Sample | All galaxies regression | $\rho$ | Excluding AGN regression | $\rho$ |
|---|---|---|---|---|
| Non-deficient | $C(\mathrm{H}\beta) = 0.096 \times \log M^2_{\mathrm{star}} - 1.344 \log M_{\mathrm{star}} + 4.804$ | 0.41 | $C(\mathrm{H}\beta) = 0.100 \times \log M^2_{\mathrm{star}} - 1.400 \log M_{\mathrm{star}} + 5.000$ | 0.39 |
| Deficient | $C(\mathrm{H}\beta) = 0.151 \times \log M^2_{\mathrm{star}} - 2.114 \log M_{\mathrm{star}} + 7.499$ | 0.40 | $C(\mathrm{H}\beta) = 0.151 \times \log M^2_{\mathrm{star}} - 2.110 \log M_{\mathrm{star}} + 7.484$ | 0.33 |
| Non-deficient | $C(\mathrm{H}\beta) = -0.570 \times \mu_{\mathrm{e}}(H) + 11.809$ | –0.43 | $C(\mathrm{H}\beta) = -0.567 \times \mu_{\mathrm{e}}(H) + 11.745$ | –0.41 |
| Deficient | $C(\mathrm{H}\beta) = -0.783 \times \mu_{\mathrm{e}}(H) + 16.321$ | –0.23 | $C(\mathrm{H}\beta) = -0.761 \times \mu_{\mathrm{e}}(H) + 15.998$ | –0.30 |
| Non-deficient | $C(\mathrm{H}\beta) = 2.577 \times [12 + \log \mathrm{O/H}] - 21.365$ | 0.48 | $C(\mathrm{H}\beta) = 2.602 \times [12 + \log \mathrm{O/H}] - 21.544$ | 0.48 |
| Deficient | $C(\mathrm{H}\beta) = 2.860 \times [12 + \log \mathrm{O/H}] - 23.638$ | 0.36 | $C(\mathrm{H}\beta) = 2.443 \times [12 + \log \mathrm{O/H}] - 20.056$ | 0.35 |
| Non-deficient | $C(\mathrm{H}\beta) = 0.981 \times \log SFR + 0.834$ | 0.39 | $C(\mathrm{H}\beta) = 1.031 \times \log SFR + 0.873$ | 0.27 |
| Deficient | $C(\mathrm{H}\beta) = 0.936 \times \log SFR + 1.380$ | 0.47 | $C(\mathrm{H}\beta) = 0.948 \times \log SFR + 1.423$ | 0.48 |

**Notes.** Linear relations are determined using a bisector fit.

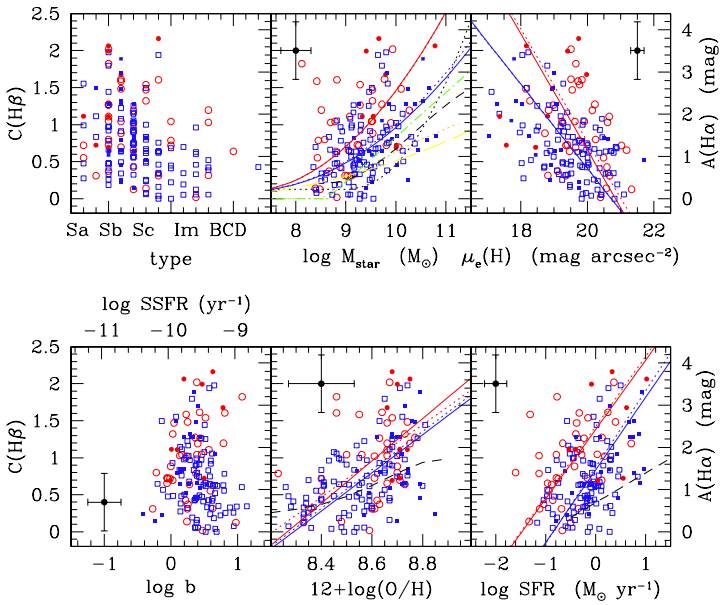


**Fig. 14.** Relationship between the Balmer decrement $C(\mathrm{H}\beta)$ and various parameters characterising the observed galaxies. From *left to right, upper row*: morphological type, logarithm of the total stellar mass (in $M_\odot$), $H$ band effective surface brightness (in mag arcsec$^{-2}$); *lower row*: logarithm of birthrate parameter $b$ or equivalently specific star formation rate SSFR, metallicity index $12 + \log(\mathrm{O/H})$, and star formation rate SFR (in $M_\odot$ yr$^{-1}$). Blue symbols are for galaxies with a normal HI gas content (HI – *def* $\leq 0.4$), red symbols for HI-deficient objects (HI – *def* $> 0.4$). Filled symbols are for galaxies hosting an AGN. The black cross shows the typical uncertainty on the data. The blue and red lines indicate the best fit to the data for HI-normal and HI-deficient galaxies respectively whenever evident correlations are present. Solid lines indicate the best fit obtained including all galaxies, the dotted lines excluding those objects hosting an AGN. The black dotted line indicates the relation obtained by Gilbank et al. (2010) using SDSS data (increased by 13% to take into account the difference between the two extinction laws used in their article, from Seaton 1979, and in our work, from Fitzpatrick & Massa 2007). The short-dashed black line indicates the relationships obtained by Garn & Best (2010) using SDSS, increased by 30% to take into account the difference between our extinction law and that used in their work (Calzetti et al. 2000). The dotted orange line is the best fit for $0.75 \leq z \leq 1.5$ galaxies given by Dominguez et al. (2012), the long-dashed yellow, line is the relation obtained by Lee et al. (2009) once $B$ band absolute magnitudes are transformed into stellar masses using the relations $\log L_H = -0.455 \times M_B + 1.289$ and $B - V = 0.711 \times \log L_H - 4.439$, combined with the relations given in Boselli et al. (2009) for measuring stellar masses. The dot-dashed green line is the best fit given in Boselli et al. (2009).

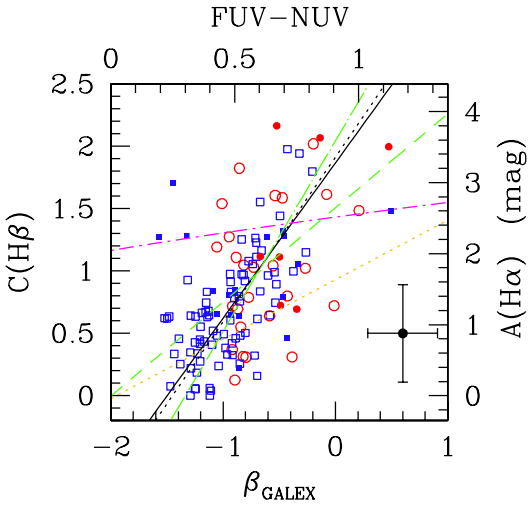


**Fig. 16.** Relationship between the Balmer decrement $C(\mathrm{H}\beta)$ and the UV slope $\beta_{\mathrm{GALEX}}$ determined using GALEX data. Blue symbols are for galaxies with a normal HI gas content (HI – def $\leq 0.4$), red symbols for HI-deficient objects (HI – def $> 0.4$). Filled symbols are for galaxies hosting an AGN. The black cross shows the typical uncertainty on the data. The solid black line indicates the best bisector fit to our data when all galaxies are included, the dotted line excluding AGNs. The dotted orange line shows the fit obtained by Hao et al. (2011), the long-dash-dotted green line and the dashed line the best fits for normal and starburst galaxies by Cortese et al. (2006), and the short-dash-dotted magenta line that for GAMA/H-ATLAS galaxies of Wijesinghe et al. (2011).